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10/693,254	10/24/2003	Donald Stuart Miller	1679.019	9091

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EXAMINER

MULLER, BRYAN R

ART UNIT PAPER NUMBER

3723

DATE MAILED: 01/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/693,254

Applicant(s)

MILLER, DONALD STUART

Examiner

Bryan R Muller

Art Unit

3723

-- Th MAILING DATE of this communication appears on the cover sheet with the corresponding address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 15 October 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) 1-16, 20, 23 and 25 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 17-19, 21, 22, 24 and 26-31 is/are rejected.
- 7) ☒ Claim(s) 26 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Claims 1-16, 20, 23 and 25 withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 10/15/2004.

### ***Specification***

2. 35 U.S.C. 112, first paragraph, requires the specification to be written in "full, clear, concise, and exact terms." The specification is replete with terms which are not clear, concise and exact. The specification should be revised carefully in order to comply with 35 U.S.C. 112, first paragraph. Examples of some unclear, inexact or verbose terms used in the specification are: The term "axe in line 1 of paragraph 0003 should be changed to "are", "water] et" in line 6 of paragraph 0026 should be changed to "water jet", several numbers for objects in figures are written incorrectly, i.e. "conduit 1S" and "conduit I1" on page 12, paragraph 0086 is the same as paragraph 0084, the number "15" is referred to as a conduit on page 13 and a tube on page 15, and other numbers appear to be incorrect on pages 12, 15, 16 and 17.

### ***Claim Objections***

3. Claim 26 is objected to because of the following informalities: The occurrence of "expect" in line 6 of claim 26 should be changed to except. Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 30 and 31 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. In reference to claim 30, it is not clearly disclosed in the specification how the pressure is increased or at what point the pressure is increased and it is unclear in the claim whether the increase of pressure is supposed to interrupt the flow to the nozzle or if the actuation valve is supposed to once actuated. In reference to claim 31, it is not clearly disclosed in the specification what valve means is intended to cause the increased proportion of fluid to flow from the pressurizing means to the point.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claim 26 recites the limitation "said body" in line 5. There is insufficient antecedent basis for this limitation in the claim. As best understood by the examiner,

"said body" is referring to the container. For the purpose of this office action, the claim will be prosecuted as such.

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 17-19, 21, 24 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hehr (3,704,553) in view of Goodwin (3,419,220).

10. In reference to claim 17, Hehr discloses a nozzle control valve for sandblasting and like spraying apparatus that comprises at least two apertured valve seat means (50, 28' and 64), each said seat means having a contact face in contact with a corresponding opposing contact face of another said apertured valve seat means and being translationally slideable in contact therewith and with respect thereto between a first position in which the apertures of each valve seat means are aligned so that said pressurized carrier fluid is passable through said apertures, and a second position wherein the aperture in one valve seat means is blocked by the contact face on another to stop flow through the valve; said valve seat means being urged sealingly together by the pressure of the carrier fluid exerted on one valve seat means. The fluid in tube 30 is flowing in the direction of the valve and because the inner diameter of the tube is larger

that the diameter of the aperture in the slideable seat, the pressure of the fluid against seat (50) will provide pressure in the direction of seat (28') and thus, urge the two seats sealingly together. Hehr does not however disclose that the valve seat means comprise a material with hardness, as measured on the Mohs scale, of at least 9. Goodwin provides a nozzle for use with abrasive-laden slurry and teaches the nozzle should be made of a material selected from a group that includes diamond for the purpose of providing the nozzle with characteristics of abrasion resistance and impact resistance to resist wear on the nozzle due to contact with the abrasive in the slurry col. 1, lines 55-67). Therefore, because the valve of Hehr is used to spray abrasive materials and thus directly contacting the abrasive particles, it would be obvious to one of ordinary skill in the art at the time the invention was made to make the valve seats of Hehr out of diamond, as taught by Goodwin, in order to protect the components of the valve from damaging abrasion and impact from the abrasive particles that would reduce the working life of the valve. Further, is taught as extrinsic evidence in the invention of Benner (2,318,360) that diamond is a hardness of 10 on the Mohs scale (col. 2, lines 12-13).

11. In reference to claim 18, the combination of Hehr and Goodwin as discussed supra provides the valve of claim 17 and Hehr further provides that the flow of abrasive particles and carrier fluid passes to a valve seat means through a tube (30) adapted to allow sliding movement of the valve seat means and to transmit thereto a force urging the valve seat means together. The tube is adapted to connect to the valve structure in a way that the valve seat (50) may obviously be allowed to slide and the force tat urges

the valve seat means together is provided by the fluid flow within the tube as discussed supra.

12. In reference to claim 19, the combination of Hehr and Goodwin as discussed supra provides the valve of claim 17 and Hehr further provides that at least two apertured valve seat means (50 and 28') comprise two valve seat means, one (50) being translationally slideable in contact with the other and with respect thereto.

13. In reference to claim 21, the combination of Hehr and Goodwin as discussed supra provides the valve of claim 17 and that the valve seat means' comprise diamonds.

14. In reference to claim 24, the combination of Hehr and Goodwin as discussed supra provides the valve of claim 17 and Hehr further provides that the slide means to which one of the valve seat means is mounted, said slide means being adapted to be moveable translationally by external actuating means (by operator), thereby causing said one valve seat means to move between said first and said second positions.

15. In reference to claim 29, the combination of Hehr and Goodwin as discussed supra provides the valve of claim 17 and Hehr further provides an apparatus for machining a workpiece, comprising pressurizing means (air compressor – col. 2, line 15), a storage vessel (10 in figure 4) for a supply of abrasive particles, a nozzle (28), and a valve of claim 17 adjacently upstream of the nozzle (46 in figure 1), adapted to interrupt flow through the nozzle.

16. Claims 17 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hehr (3,704,553) in view of Kyoto-shi (EP 0884509 A1).

17. In reference to claim 17, Hehr discloses the valve as discussed supra, but again fails to disclose that the valve seats comprise a material with a hardness of 9 on the Mohs scale. Kyoto-shi discloses a disc valve that provide two valve bodies which slide with each other wherein at least one of the valve bodies is made of ceramic and the surface of the body is coated with a diamond-like carbon (abstract, lines 7-11) to enhance adhesion forces to maintain a leak free and stable sliding characteristic for an extended period of time (abstract, lines 1-6). Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made to provide the surfaces to make at least one of the seat means of the invention of Hehr out of ceramic with a diamond-like hard carbon film in order to enhance adhesion forces to maintain a leak free and stable sliding characteristic for an extended period of time. Thus, the valve seat would comprise a composite diamond/ceramic material and it can be assumed that the hard carbon would have a Mohs hardness of approximately 10 because it is diamond-like.

18. Claims 26-28 rejected under 35 U.S.C. 103(a) as being unpatentable over Hehr ('553) in view of Goodwin ('220) further in view of Shipman (4,569,161).

19. In reference to claim 26, the combination of Hehr and Goodwin as discussed supra provides the valve of claim 17 and Hehr further provides a container (10) that contains an abrasive that is to be distributed through fluid pressure but Hehr does not disclose any kind of metering apparatus for metering the abrasive supply to the nozzle. Shipman provides a pneumatic powder metering device for abrasive jet machining that



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comprises a container (10) for abrasive particles closeably sealed by a cap (12), said cap comprising an inlet (20) means connected to a riser tube (26) within the container, each of such restricted bore as substantially to prevent flow therethrough, except under an imposed pressure differential, and an outlet means (18), the bore of which comprises such a restriction as substantially to prevent flow therethrough, except under an imposed pressure differential. Shipman discloses that the feed supply orifice (outlet) is a small diameter (col. 2, line 37) and that no powder will flow through orifice 18 until the valve is actuated (col. 2, lines 54-56) causing an imposed pressure differential. It is also disclosed by Shipman that the inlet (20) and riser tube (26) are present to transmit pressurized air to the container to equalize pressure within the container (col. 2, lines 46-50), thus there would be no air flow through the riser tube or inlet, except under an imposed pressure differential. Shipman finally teaches that his invention provides an improved powder throttling mechanism for precisely metering powders in abrasive jet machining processes and automatically adjusts powder flow to provide proper proportions of powder (col. 1, lines 49-54). Therefore, it would be obvious to one of ordinary skill in the art at the time the invention was made to replace the container and powder supply apparatus of Hehr with that of Shipman to provide proper proportions of abrasive powder to the pressurized fluid of Hehr in order to prevent wasted abrasive (which would be costly) and to produce the proper amount of abrasive for optimal fluid jet machining.

20. In reference to claim 27, Hehr discloses a container that contains a supply of abrasive particles suspended in a carrier fluid but Shipman discloses a similar container

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that contains a supply of abrasive particles suspended in air. Upon the obvious combination of these two inventions along with the teachings of Goodwin, as discussed supra, the air in the invention of Shipman would be replaced by the fluid as disclosed by Hehr.

21. In reference to claim 28, Hehr discloses a container that contains a supply of abrasive particles suspended in a carrier fluid but fails to disclose what fluid it may be, but it would be an obvious choice to make such fluid water because it is a readily available, cheap fluid and it is commonly known in the art that water may be combined with abrasives to create abrasive slurries. Shipman discloses a similar container that contains a supply of abrasive particles, such as aluminum oxide (col. 1, line 33). Therefore, it would be obvious that, upon the combination of these inventions as discussed supra the carrier fluid would be water and the abrasive will be aluminum oxide.

### ***Conclusion***

22. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Pickard (5,605,497) and Schachter (3,626,841) disclose containers and inlet/outlet structures similar to those disclosed by applicant and Carpenter (3,629,976) discloses a valve similar to that disclosed by applicant.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bryan R Muller whose telephone number is (703)305-0487. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph J Hail III can be reached on (703)308-2687. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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1/3/2005



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